Working With Farmers For Better Land Husbandry

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recommended is ignored. PRA is holistic, and encourages socio-economic consideration in respect to both production and conservation. By encouraging the articulation of real feelings PRA aids understanding of the socio-economic rationale for what people do. With a degree of understanding it becomes possible for professionals to help match solutions to farmers' problems, and for everyone to agree practical changes that make sense. If a new or revised practice increases benefit the farmers are likely to adopt it.

There will never be enough researchers and extensionists to develop and transfer messages to service all farmers. A successful transformation of roles initiated through PRA could allow farmers to take on some responsibilities for research and extension, and to be helped in this work through partnerships with development professionals. Implicit in this concept is a potential for unleashing enormous power to influence development positively, by emphasizing professional roles as facilitators, by mobilizing more people to research practical improvements on-farm, and by bringing to public notice good practices through improving the mechanisms for farmer-to-farmer information exchange.

Promoting organized and managed activity through the allocation of functional roles is basic to economic success. By placing emphasis upon communities and interest groups to create and improve organization and decision-making, PRA switches attention from the individual farmer and helps provide a foundation for a general commitment to sustainable action and economic improvement.

The thrust of PRA is for decentralization, and the provision of mechanisms that enable people to command and manage their resources. Helping to build confidence, organization and capability to consider and deal with conservation issues and resource management at the grassroots level will help improve practical land husbandry.

PRA is at a very early stage of development. Operational methods are still being invented and refined, and the potential of groups and individuals to contribute to development is being assessed. The results so far indicate considerable potential and scope. PRA has been used effectively by expert facilitators to assist in project design. Development of methods for participatory monitoring and evaluation (PM and PE) is a field that needs attention, so that we can learn about the reality of increased client independence in development. These essential processes should incorporate in-depth consideration of the technology adoption and dissemination processes. Through high profile case studies, implementation of PRA can lead us to a better understanding of the processes of change in the rural environment and optimum roles for facilitators and land users. All this is vital knowledge if good land husbandry practices, worked up and adopted as a consequence of PRA by a few target farmers, are to be taken up by many farmers.

A paper contributed from Zambia is a brave example of people taking a step towards participatory development by gaining experience in diagnostic survey. Typical problems faced by those intent to investigate the potential of rural appraisal are illustrated. The problems are burdensome,

partly because organizational structures are not matched to a set of functions required for either multi-disciplinary or inter-disciplinary activity in concert with farmers, and also because money and experience are scarce resources. Ideally, a review of functions would precede changes, so that structures can be established to meet functional needs. It is unlikely that major agencies will take radical steps of review, and change is likely to be piecemeal as confidence in appraisal and participatory methods grows.

A good deal of work is necessary to develop methods of participatory development and to demonstrate a significant correlation between application of methods and indicators of developmental success. However, when conducted by experienced personnel, RRA and PRA are already shown to be useful for diagnosing on-farm needs and development directions. The most immediate need is to provide training and hands-on experience for many more people, so that appraisal can be more widely used.

Participatory Rural Appraisal

ROBERT CHAMBERS

Evolution of rapid rural appraisal

The philosophy, approaches and methods now known as rapid rural appraisal (RRA) began to coalesce in the late 1970s. There was growing awareness of the biases of rural development tourism, and of the costs, inaccuracies and delays of larger-scale questionnaire surveys. More cost-effective methods were sought for outsiders to learn about rural life and conditions.

In establishing the principles and methods of RRA, people and institutions from many countries contributed. Numerous sub-groups produced ideas, tested them and reported their results. Among these, Gordon Conway and others (Gypmantasiri *et al.*, 1980) pioneered agro-ecosystem analysis (Conway, 1985) at the University of Chiang Mai in Thailand. In the mid-1980s the University of Khon Kaen, also in Thailand, was a world centre in developing theory and methods, especially for multi-disciplinary teams and for institutionalizing RRA as part of professional training (Khon Kaen, 1987). In the late 1980s, the International Institute for Environment and Development in London became a leading voice (McCracken *et al.*, 1988). In health and nutrition a parallel movement, drawing on social anthropology, was evolved in the 1980s under the rubric of rapid assessment procedures (RAP) (Scrimshaw and Hurtado, 1987).

Towards the end of the 1980s, numerous RRA approaches and methods were eliciting a range and quality of information and insights inaccessible with more traditional methods. RRA was argued to be cost effective, was more generally accepted, and gave rise to participatory rural appraisal (PRA) (Mascarenhas *et al.*, 1991) which evolved, and continues to evolve, rapidly.

Principles and practice of RRA and PRA

RRA is mainly extractive. Outsider professionals go to rural areas, obtain information, and then bring it away to process and analyse. PRA, in contrast, is participatory. Outsider professionals still go to rural areas, but their role is more to facilitate the collection, presentation and analysis of information by rural people themselves. With RRA the data is owned by the outsiders, and often not shared with rural people. With PRA data is owned by rural people, but usually shared with outsiders.

That said, good RRA and PRA have features in common. Most practitioners would agree on the following:

- *A reversal of learning* – outsiders learning from and with rural people, on site, and face to face. Rural people's criteria, categories, and priorities, and their indigenous technical knowledge are elicited
- *Learning is rapid and progressive* – conscious choice and flexible use of methods to explore important questions as they arise, with improvisation, iteration and probing
- *Trade-offs* – sought between quantity, accuracy, timeliness and relevance of information
- *Triangulation* – used to crosscheck and confirm data and to improve approximations, using several, often three, methods of sources and information
- *Optimal ignorance is sought* – meaning not trying to find out more than is needed, and not making inappropriately precise measurements. The collection is avoided of data that will not be used
- *Biases are recognized and offset* – for example biases of movement and contact which are spatial (where outsiders go), institutional (what organizations they visit), personal (who is met) and temporal (when they go, by seasons and time of day). Special efforts are made to meet those, often women and the poorer, and who tend otherwise to be missed, and
- *Team composition balanced* – in terms of gender, discipline, and other dimensions, and team interactions are consciously managed.

Beyond these common factors, PRA has added others which have not been prominent in RRA. These include:

- *They do it* – facilitating investigation, analysis, presentation and learning by rural people themselves, so that they own the outcomes. This often entails starting a process and then sitting back and not interviewing or interrupting
- *Self-critical awareness* – meaning that practitioners are continuously examining their behaviour, and trying to do better
- *Relaxing and not rushing* – exploiting the paradox that taking plenty of time in PRA is often faster and better than trying to be quick
- *Embracing error* – meaning welcoming error as an opportunity to learn to do better
- *Using one's own best judgement at all times* – meaning accepting personal responsibility rather than vesting it in a manual or a rigid set of rules, and
- *Sharing of information and ideas* – between rural people, between them

and practitioners, and between different practitioners, and sharing camps, training and experiences between different organizations.

The menu of methods for RRA and PRA

In its early days, RRA seemed little more than organized common sense, and some of the methods had been in use already. During the 1980s, though, much creative ingenuity was applied and more methods invented. In approach, there is a distinction between RRA and PRA; but most of the methods are shared. An indication of the range and variety of RRA/PRA methods can be given in a listing of some of the more common ones:

- Secondary sources – such as files, reports, maps, articles and books
- Do-it-yourself – asking to be taught to perform village tasks, such as transplanting, weeding, ploughing, field-levelling, drawing water, washing clothes, thatching
- Key informants – asking 'who are the experts?' and seeking them out
- Semi-structured interviews – this has been regarded by some as the core of good RRA. It can entail having a mental or written checklist, but being open-ended and following up on the unexpected
- Groups of various kinds – (casual, specialist, deliberately structured, community/neighbourhood). Group interviews and activities are often powerful and permit crosschecking of information
- Sequences or chains of interviews – from group to group, or group to key informant, or a series of key informants, each expert on a different stage of a process (for example, men on ploughing, women on transplanting and weeding, and so on)
- Villagers and village residents as investigators and researchers – women, school teachers, volunteers, students, farmers, village specialists, poor people. They can do transects, observe, and interview other villagers
- Participatory mapping and modelling – in which rural people make social, demographic, health, natural resource (soils, trees and forests, water resources and the like) or farm maps, or construct three-dimensional models of their land
- Participatory analysis of aerial photographs (often best at 1:5000)
- Transects – systematically walking with informants through an area, observing, asking, listening, discussing, identifying different zones, local technologies, introduced technologies, seeking problems, solutions and opportunities, and mapping and diagramming resources and findings
- Time lines – listing major remembered events in a village with approximate dates
- Local histories and trend analysis – people's accounts of the past, of how things close to them have changed, ecological histories, changes in land use and cropping patterns, changes in customs and practices, changes and trends in population, migration, fuels used, education, health, and so on, and causes of these
- Seasonal diagramming – days and distribution of rain, amount of rain or soil moisture, crops, agricultural labour, non-agricultural labour, diet,

food consumption, sickness, prices, animal fodder, fuel, migration, income, expenditure, debt

- Livelihood analysis – stability, crises and coping, relative income, expenditure, credit and debt, multiple activities, and so on
- Participatory diagramming – of flows, causality, quantities, trends, rankings, scorings, in which people make their own systems diagrams, bar diagrams, pie charts, and estimates using seeds, pellets, fruits or stones as counters, sometimes combined with participatory maps and models. *Chapati* or Venn diagramming is a method for identifying individuals and institutions important in and for a community, and their relationships
- Well-being or wealth ranking – identifying clusters of households according to well-being or wealth, including those considered poorest or worst off
- Analysis of difference – especially by gender, social group, wealth/poverty, occupation and age. Identifying differences between groups, including their problems and preferences
- Contrast comparisons – asking one group why another is different or does something different, and vice versa
- Ranking and scoring, especially using matrices and seeds to compare through scoring, for example different trees, or soils, or methods of soil and water conservation, or varieties of a crop
- Key local indicators – such as, what are poor people's criteria of well-being, and how do they differ from those we assume for them
- Key probes – questions which can lead directly to key issues such as 'What do you talk about when you are together?' 'What new practices have you or others in this village experimented with in recent years?' 'What vegetable, tree, crop, crop variety, type of animal, tool, equipment . . . would you like to try out?' and 'what do you do when someone's hut or house burns down?'
- Case studies and stories – a household history and profile, coping with a crisis, how a conflict was or was not resolved, and the like
- Team interactions – changing pairs, evening discussions, mutual help, and so on, where the team may be just outsiders, or a joint team with villagers
- Presentations and analysis – where maps, models, diagrams, and findings are presented by villagers, or by outsiders
- Brainstorming – by villagers alone, by villagers and outsiders together, or by outsiders alone, and
- Report writing at once – either in the field before returning to office or headquarters, or by one or more people who are designated in advance to do this immediately on completion of the RRA or PRA.

Practical tips

It is easier to give advice than to take it. Here is a personal list of some practical tips:

- Don't lecture. Look, listen and learn. Facilitate. Don't dominate. Don't interrupt or interfere. Once a task has been initiated let people get on with it

- In a discussion give people time to think or discuss among themselves
- Embrace error. We all make mistakes, and do things badly sometimes. Never mind. Don't hide it. Share it
- Try to obtain opinions from all groups, especially those – women, the poorer, the more remote, those who do not use services – who are liable to be left out
- Observe keenly to determine whether your eyes confirm the information given
- Relax, don't rush
- Meet people when it suits them, and when they can be at ease, not when it suits you, and don't force discussions to go on for too long. Stop before people are tired
- Be around in the evening, at night and in the early morning. Stay the night in villages if you can
- Allow unplanned time, walk and wander around
- Ask about what you see
- Probe. Often we accept the first reply to a question as being all that is needed, when there is much to be learnt, and people know more than we suppose
- Use the six helpers – who, what, where, when, why and how
- Ask open-ended questions
- Show interest and enthusiasm in learning from people
- Have second and third meetings and interviews with the same people and discuss your findings
- Allow more time than expected for team interaction, and for changing the agenda, and
- Enjoy it! RRA is interesting, and should be fun for all.

More about methods and other aspects of RRA and PRA is to be found in the further reading references at the end of this book.

Participatory rural appraisal

PRA is facilitated by outsiders but more than RRA it involves rural people themselves in investigation, in the diagramming, presentation, analysis and ownership of information, in the identification of preferences and priorities, and in planning, action, monitoring and evaluation. Thus, it is a new form of RRA which shifts the initiative and the action from outsider to insider, from the trained professional to the rural people themselves.

Besides agro-ecosystem analysis, with its special strengths in observation and diagramming, and earlier RRA with its special strengths in semi-structured interviewing and multi-disciplinary team management, PRA has other antecedents. These include activist research, in which under-privileged people are encouraged and enabled to analyse their conditions. Applied social anthropology, with its participant observation and its distinction of *emic* (insider) from *etic* (outsider) values, categories, and views of reality, and farming systems research, with its understanding of the complexity and diversity of farming systems are both important here.

The term PRA was probably first used during 1988 to describe village-level investigations, analysis and planning undertaken in Kenya (NES *et al.*, 1990). A parallel movement in India was taking place, notably with the Aga Khan Rural Support Programme in Gujarat (McCracken, 1988), and subsequently more and more NGOs in India have evolved and applied PRA, with MYRADA, Bangalore playing a prominent part in development, dissemination, and training government organizations. Much of the Indian experience was captured in *RRA Notes Number 13* (Mascarenhas *et al.*, 1991) which reported on a PRA workshop convened by MYRADA in Bangalore in February 1991. In 1991 and early 1992 there was an increasing interest in many countries. Among other forms of south to south sharing, trainers and practitioners from Kenya, Nigeria, Senegal, Sudan, Tanzania, Zimbabwe and other countries visited India, hosted by Action-Aid, AKRSP and MYRADA, for familiarization with approaches and methods current in India.

The core of PRA

PRA takes different forms in different countries and organizations. In Kenya, one form is described in a manual, and is linked to the production of a Village Resource Management Plan (NES *et al.*, undated). Another form has been developed by the soil and water conservation branch of the Ministry of Agriculture in conjunction with the International Institute for Environment and Development (Pretty, 1990). In India, a plurality of forms has evolved, but with a common underlying philosophy and experience. Drawing on various Indian and IIED approaches, a core of PRA can be suggested. In this, villagers' capabilities, outsiders' rapport, and visual sharing are key features.

Villagers' capabilities

Good PRA empowers villagers by encouraging them to take the lead in investigation and analysis. Rural people have shown a greater capacity than outsiders have expected to map, model, quantify and estimate, score, diagram, and analyse. When local materials are used, like the ground for mapping and diagramming, or seeds for quantifying, estimating and scoring, participation is often uninhibited and relaxed, with a willingness to express, share, crosscheck, and analyse knowledge.

Maps made on the ground or on paper have been of several types: social maps, indicating households and social groups; demographic and health maps, indicating women, men, pregnant women, children who are breast-feeding, immunization staus, handicapped, drunken husbands, and so on; well-being or wealth maps, showing who is considered well off, badly off and so on; natural resources maps, including soils, land types, forests and trees, and water. Matrices can be used for scoring and ranking items, such as types of trees, varieties of a crop, methods for soil and water conservation, or the characteristics of local categories of soils. Diagrams have been used by rural people to present and analyse many types of information,

including nutrient flows on a farm, the impacts of a project, important people and institutions in a community and outside it, and the services used by villagers. With estimating and quantification also, as with maps, models, matrices and diagrams, villagers have shown themselves capable of presenting and analysing information far beyond normal professional expectations.

In all these, the methods and materials used have helped villagers to express and analyse their knowledge, but methods in themselves are not enough.

Rapport

The key to facilitating such participation is good rapport. For this, the behaviour and attitudes of the outsider as facilitator and catalyst are basic. Some of the keys are listening and learning, taking a keen interest, joining in activities, and patience. Fieldworkers now ask villagers to teach them, show respect and encourage people to have confidence in their ability. The fieldworker becomes a facilitator and hands over the lecturer's stick to become a student.

Visual sharing

Visual sharing is a common element in PRA. With a questionnaire survey, information is transferred from the words of the person interviewed to the paper of the questionnaire schedule where it becomes a possession of the interviewer. In contrast, with visual sharing of a map, model, or diagram, all who are present can see, point to, discuss, manipulate and alter physical objects or representations. In participatory mapping and modelling, villagers draw and model their villages and resources, deciding what to include, and debating, checking and modifying detail. Everyone can see what is being said because it is being done. The ground and local materials used have the advantage of being theirs, media which villagers can command and alter with confidence. Those who take part themselves learn from what is shown. Maps, matrices and diagrams provide visible checklists and agendas, and can be interviewed, providing a basis and focus for reflection and planning.

Training and problems to be addressed

A current question is what should be done about training. Such is the interest in PRA that demands for training of government and NGO staff are increasing. Three important problems are presented by this perceived need.

Training courses tend to formalize, codify and standardize, often in the name of quality. PRA requires flexibility and rapid adjustment to seize opportunities in impromptu situations. The lack of a manual for PRA in India has been much of its strength, for would-be practitioners have been forced to learn, not from books but through sharing and from their

own field experiences. Many of the best innovations have come from practitioners not following established methods. It is not books of instruction but personal commitment, critical awareness and informed improvisation and creativity, which assure quality.

Faddism is another problem. Like farming systems research, RRA and PRA could be discredited by becoming too fashionable too quickly, and then adopted too fast and misused. The warning signs are there: demand for training which far exceeds the competent trainers available, requirements that consultants use PRA and then, consultants who say they will do so, but do not know what PRA entails, and the belief that good RRA and PRA are simple and easy, quick fixes, which they are not.

The word rapid is now a liability. It is in danger of being used to legitimize biased rural development tourism. It would be better if the first R of RRA stood for relaxed, implying plenty of time. Hurry usually means that the poorest are not met, listened to, nor learnt from, when much of the rationale for RRA/PRA is to learn from them, and to empower them.

RRA training conducted in Thailand in 1990 took six weeks, which was considered not long enough (Grandstaff *et al.*, 1990). PRA training in India has been much shorter. It has been hands-on participatory field training. A typical training experience has required camping in a village, and learning and using various methods. This is all part of a participatory process which leads to identifying actions by and with villagers. Staying a number of nights in the village intensifies and concentrates the experience. Villagers are encouraged to map, diagram, participate in transects, and plan. One aim of the training is to facilitate changes in outsiders' perceptions and behaviour, listening not lecturing, learning progressively, embracing error, being critically self-aware and participating themselves, for example by reversing roles and being taught by villagers how to perform village tasks. These experiences can open up a new range of possibilities and a sense of freedom to experiment and innovate. It is then not necessary to be trained in all the methods. Methods can be tried, improvized and subsequently adapted, and new ones can be invented. The creativity of both villager and outsider is released and developed through direct and mutual participation.

Potentials of RRA and PRA

The long-term potentials of RRA and PRA as they evolve are hard to gauge but look large.

In a more extractive, RRA mode, *ad hoc* investigations have been carried out on a myriad of topics. Examples include: why small farmers do and do not plant trees; why farmers do not maintain conservation terraces; how poor people spend lump sums of money; local practices of soil, water and nutrient conservation and concentration; how women and men spend their time; why an innovation has not been adopted; seasonal deprivation; migration; the impact of a road; the reality of what is happening in a government programme; the impact of structural adjustment on small farmers; and the rapid gathering of information for government decision-making.

Beyond RRA, the more participatory modes and methods of PRA have strengths. By transferring the initiative to rural people, PRA generates rapport and encourages outsiders to learn. By eliciting and cross-checking a lot of information in a short time, the process is cost-effective for outsiders as well as for villagers. By enabling people to present and analyse what they know, it generates commitment to action which may then be sustainable, as in Kenya and India. By being flexible and adaptable, and by encouraging inventiveness and innovation, it has the capacity to grow through the creativity of both rural people and outsiders. As it is often interesting, powerful and fun it engages all concerned, and makes them want to do more.

The longer term potential of PRA can already be indicted by practical applications. An illustrative list can include:

- Participatory watershed planning and management (including rapid catchment analysis (Pretty, 1990))
- Degraded forest assessment, protection, nurseries and planting
- Identification of credit needs, sources and interventions
- Health and nutrition assessments
- Planning the location of water supplies
- Assessments of biogas potentials and actions
- Selecting poor people for a programme, and deselecting the less poor
- Rehabilitation of small-scale gravity flow irrigation
- Preparing village resource management plans (NES *et al.*, undated)
- Participatory trials of crop varieties
- Identifying non-agricultural income-earning opportunities
- Investigating markets and smallholder marketing potentials
- Assessing and dealing with emergency situations
- Empowering women
- Orientation for students, NGO workers, government staff, and university and training institute staff towards a culture of open learning, and
- Participatory evaluation of programmes and planning the next phase.

And there have been many more.

Perhaps most significantly, PRA as it is evolving is an enabling approach for widely desired directions of change. It supports decentralization and diversity, providing means for local people to take command of their resources and to determine what fits their needs. By involving them from the very beginning of a development action, it helps them to own it more, and so contributes to commitment and sustainability. PRA is part of the paradigm for rural development which stresses process, participation, local knowledge and reversals of learning. Nothing in rural development is ever a panacea, and PRA faces problems of speed of spread, scale and quality assurance. But for the 1990s and beyond, its promise is evident. To make the 1990s a decade of local empowerment and diversity, participatory rural appraisal could have a key part to play.

Sustainable Small Farm Development – Frontiers in Participation

ROBERT CHAMBERS

Changing ideas in rural development

We live in an era of change unprecedented for its speed and unpredictability. In rural development ideas have been changing rapidly. Twenty years ago women were not much mentioned. Only 10 years ago, the environment was not high on the agenda. Now in 1991 we have an evolving consensus on the moving frontiers of development thinking and practice. It values indigenous technology, farmers participation in research, sustainability, and the enabling and empowering of rural people to gain for themselves much more of what they want and need. Increasingly, these changing values have been expresed in the concept of sustainable livelihoods, as a central objective that can be shared by rural people and by policy-makers.

Sustainable livelihoods

Livelihoods can be defined as adequate stocks and flows of food and cash to meet basic needs. Secure livelihood means the ability to meet contingencies without becoming permanently poorer. Sustainable refers to the maintenance or enhancement of resource productivity on a long-term basis. Rural livelihoods are diverse and often complex, with non-agricultural and non-farm as well as agricultural and farm sources. Nevertheless, the great majority depend upon production from a natural resource base.

Enabling rural people to gain adequate, secure and sustainable livelihoods would be a challenge if populations were static. With the population of sub-Saharan Africa growing at over three per cent a year (and liable at that rate to double in 20 to 25 years), the prospect is daunting.

Professionals as problems

The record of rural and agricultural development has been, at best, mixed. The question continues to be asked why performance has been so poor. Of all the changes of the past decade, one of the most hopeful has been the growing recognition that educated professionals are much of the problem, and rural people a large part of the solution.

This has been hard for us professionals to accept. Bookish education has given us the idea that our knowledge is superior. We know and they are ignorant. We should plan for them. Our packaged technology from research stations is good. It follows that those who do not adopt our recommendations, or who deviate from them, must be stupid and ignorant. But this explanation is no longer plausible. Today many are seeking other

reasons why so many packages are not adopted. The answers are to be found not in them but in us.

Development professionals have often failed to understand small farmers' priorities, or why they do what they do. Isolated on research stations, researchers are often unaware of the nature of farmers' technology. From a detailed review of the literature, Reij (1990) concluded that 'our current knowledge of indigenous soil and water conservation techniques in Africa is extremely limited'. Professionals have rarely appreciated farmers' actions and abilities as domesticators and experimenters (Richards, 1985, Juma, 1989) or perceived the diversity and complexity of small farming systems.

While farmers manage and experience the whole of their farming systems, we are channelled by disciplinary training into narrow ruts. Soil and water conservation as a label does at least bring together soil and water, and professions which might otherwise consider soil and water separately. But our lack of multi-disciplinarity often leads to the neglect of much else, especially those dimensions which are social and economic.

Then, within our disciplines, we practise reductionism. We simplify complex reality into its parts, and control conditions in order to study and measure it. Our research, in consequence, generates standard packages from controlled environments. Centralized organizations then disseminate these as uniform solutions, but they fit neither the complex and diverse farming systems nor the unpredictable and uncontrollable conditions of farmer clients. In order to raise production and reduce risk, farmers, in contrast, seek not to simplify but to complicate, not to standardize but to diversify.

Our time frames also tend to be short. Projects are often to be completed in three or five years. In the field, targets require that physical works are completed by the end of the financial year. We need to learn from these mistakes, and see how we can do better in the future.

Farmers as part of the solution

The picture should not be exaggerated. There have been successes (Conroy and Litvinoff, 1988). And these often point to rural people, and especially farmers, as the source of solutions.

Farmers here refers to women and men, especially resource-poor smallholders. There are three respects in which farmers are a key to finding solutions: their knowledge, their time horizons, and their analytical capabilities.

Recognition of the validity and usefulness of indigenous technical knowledge is now widespread (Brokensha *et al.*, 1980, Richards, 1985). Farmers are experts on most aspects of their farming systems, and especially those which are readily observable. They have to be in order to survive. Of course, scientists have knowledge, especially of microscopic phenomena, which farmers lack. But in terms of their farming practices, their priorities and their constraints, farmers have a comparative advantage.

The stereotype of poor farmers as always living from hand to mouth, and having no thought for the morrow, is not borne out by observation. It is true that those who are desperate will sacrifice the long-term for the short-term survival, and those who are insecure and fear loss or displacement, may not invest for the future. But there is much evidence – in planting and protecting trees, in indigenous soil, water and nutrient harvesting and concentration, in strategies to increase land holdings – that whenever they are secure, and even sometimes when they are not, small-farm families have a propensity to strive to invest their labour for future benefits.

Evidence has also accumulated that farmers have considerable ability to analyse. (Chambers *et al.*, 1989, Mascarenhas *et al.*, 1991). What has been missing is our ability to facilitate their analysis. If farmers analyse their farming systems they automatically screen out much redundant information. Recent participatory experience suggests that if rapport, methods and materials are right, farmers can analyse efficiently and produce sound decisions about development initiatives.

The case of deposition fields

The differences in the thinking, perception and priorities of farmers and of trained professionals can be illustrated with references to parts of north Karnataka, India, where farmers have for some decades been making deposition fields in *nallas* (seasonal watercourses). They build low stone barriers to trap silt, and gradually build these up year by year to make larger and deeper fields, fitting the structure to the landscape. The barriers are designed to collect soil, water and nutrients in these fields, to provide an important and relatively stable source of food and cash.

The government programme for soil and water conservation, in contrast, constructed check dams of a standard design. These were completed and then left. Typically, they were larger and higher than the farmers' silt trap barriers. They were designed for the professionals' objectives of slowing water flow and reducing erosion.

This case presents some common contrasts between professionals and farmers. The professionals took a short-term view, and built structures to meet their annual targets. Their general objective was to conserve, that is to keep soil in place and to slow and trap water. The farmers took a long-term view, to build up a productive resource. Their general objective was to concentrate, that is to trap soil, water and nutrients and build up a sustainable source of stable livelihood. For outside professionals, erosion is always an evil. For farmers it can also be bad. But sometimes, as in this case, it can provide a costless means of transporting soil to places where it will be more productive.

As this Indian example illustrates, the training and incentives of professionals condition them to perceive soil, water and agricultural production differently from farmers. Recognizing this is basic to participation. For unless it is farmers' priorities, rather than those of professionals, which are being met, farmers are unlikely to participate. Unless they participate, soil and water conservation is unlikely to be sustainable.

Participation

In the past five years, the frontiers of participation have been on the move, as more has been learnt about farmers' ability to analyse and innovate, and how outsiders can assist them. In rural research, approaches and methods have been and are being rapidly invented and evolved, but are still underdeveloped, very much a frontier.

Three streams of innovation stand out in participation: participatory rural appraisal (PRA); participatory technology development (PTD); and community participation.

PRA

PRA is a recent offshoot from rapid rural appraisal (RRA). Whereas RRA is extractive, with outsiders extracting information which they then take away and analyse, the term PRA can be used to describe a process which is much more participatory, with rural people presenting, analysing, owning and retaining information, but sharing much of it with outsiders. With PRA, development professionals act in a facilitating role.

PTD

There are many labels for farmers' participation in research and development (R & D) *Farmer-Back-To-Farmer* (Rhoades and Booth, 1982), *Farmer Participatory Research* (Farrington and Martin, 1988), *Participatory Technology Development* (ILEIA 1989), and *Farmer First* (Chambers *et al.*, 1989). The labels do not matter – the substance does.

The essence of PTD is a shift from the transfer of technology (TOT) model. In TOT, technology is generated by professionals in research stations and laboratories, and then transferred as packages to farmers who are taught and trained. In the PTD model, teaching and training does still have some part to play, as with simple designs for farmers' own experiments (Bunch, 1985). But central to PTD are farmers' own analysis, design, observation and evaluation, conducted by themselves. The roles of scientists and extensionists then change. They are not transferers of technology, but convenors of farmers' groups, catalysts and facilitators of farmers' discussions and analysis, searchers for and suppliers of what farmers want and need, consultants for farmers' experiments, as well as tour operators who arrange visits for farmers to learn from each other. The main aim is not to transfer technology but to enhance farmers' competence, and assist them to identify acceptable opportunities.

In PTD, the standard package of practices of TOT is replaced by a basket of choices from which farmers can select for their diverse and complex farming conditions. A function of the formal research system is to help farmers to generate choices. Farmers will continue to experiment, innovate and adapt technology themselves, doing their own R & D, while development professionals facilitate these processes.

Community and group participation

The third stream of innovation is in relation to communities and interest groups. There are many traditions of community organization and

participation in resource management (Chamala and Mortiss, 1990). What is perhaps most new is the awareness of the potential for group and community action to promote sustainable development. Fields of potential include:

- Managing resources held in common. This includes communal lands, forests, rivers, and bodies of water, the control of pests and diseases, and soil and water management where interests are linked, as in watersheds
- Managing funds raised locally, or provided by government or NGOs, and providing services such as credit
- Selection of farmers for trials, and as experimenters, monitoring and learning from their experiences, visiting innovators, and spreading good technology, and
- Making demands on government agencies, including demands on extension to search for needed information and genetic material, and on research for work on farmers' priority problems and opportunities.

Sustainable livelihoods

The three streams of innovation in participatory development intermesh, and each is constantly changing. In these newer forms, agricultural research and extension roles are reversed. Farmers do most of the survey and analysis, make requests and demands, and then experiment with their own R & D to develop technology with a local fit. Much of the significance of participatory approaches lies in their potential for generating sustainable livelihoods for future rural populations. Four aspects stand out.

The first concerns the intensification of farming systems. The association of production technology with population density is strong. In general, as population to land ratios rise, and as farm sizes decline, so farming systems are intensified. New enterprises are added, and internal linkages multiplied, both to increase production and to reduce risk. Farmers' comparative advantage in analysis compared with scientists' rises with the complexity of the system.

The second aspect concerns farmers' priorities. It is farmers who are the experts on their priorities, which can differ from those of scientists or officials (Chambers *et al.*, 1989). Unless farmers can express their priorities, and through participation make demands on research and extension, the technology provided to them is liable to be inappropriate or harmful.

The third aspect concerns security and the long term. Secure land and tree tenure, and access to other resources, can be preconditions for farmers taking a long view and investing for sustainable livelihoods. Secure tenure can create a virtuous circle. The more secure farmers feel, the more labour they are inclined to invest for the long term. In turn, the more labour they invest, the more secure they feel.

The fourth aspect concerns dynamism and competence. Conditions are never static. Small farmers face changing and unpredictable physical, social

and economic environments. To gain a sustainable livelihood, a farming family must be dynamic and innovative. Professionals have a role to play in enabling farming families to be alert and active, enhance their competence, and in promoting and supporting group and community action.

Conclusion: the first frontier

The conclusion is a paradox. Sustainable development is to be sought first not in the farming family, or the community, but in ourselves, the trained professionals. Our power, beliefs, reductionism and short time horizons are much of the problem. While farmers' knowledge, systems thinking, long-term investments, and enhanced competence and participation are much of the solution. It is not a case of either professionals' knowledge and competence, or farmers' knowledge and competence. The need is for a balanced mix, which means a shift to the farmers' side to enhance farmers' analysis and innovation.

For this balance and enhancement, recent experience points to the primacy of outsiders' behaviour and attitudes. By lecturing instead of listening, teaching instead of learning, by 'holding the stick' instead of handing it over, development professionals all over the world have inhibited the creativity and communication of rural people. The challenge now is to change our methods and reverse our behaviour. It is to enable and empower farming families to express their knowledge and strengthen their analysis. Thus, the role for new science-based physical and biological technologies is to provide baskets of options from which farmers can choose for local fit. In the 1990s there will continue to be traditional questions of how to generate those technologies. But more important will be the new frontier, of how to develop and spread among professionals effective means to enhance farmers' participation, competence and choice.

Participatory Rural Appraisal for Agroforestry

M. AVILA

Understanding farming systems

Agroforestry practices are ubiquitous, irrespective of agro-ecological and socio-economic environments. There is a very wide range of tree species and methods. As it is always easier to improve existing systems than to invent new ones, a good start for agroforestry research and development is to identify the types, roles and respective uses of woody species within the farm geography. Boundaries, home compounds, cropland, woodlots, pastures and other components of land use may be distinguished, and their tree components investigated. It is important to identify the order of importance in respect to: